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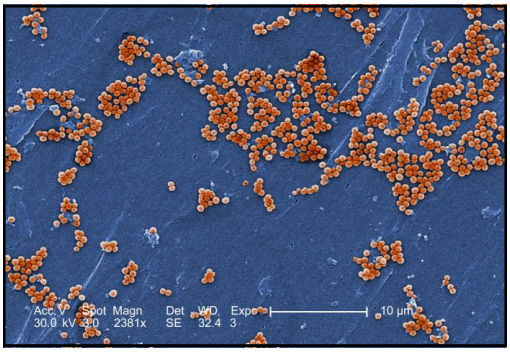
Severe MRSA Pneumonia Associated with Influenza

Methicillin-resistant *Staphylococcus aureus* (MRSA) infections remain in the news. Although MRSA most commonly causes skin and soft tissue infections, MRSA also has been reported to cause severe community-acquired pneumonia particularly when associated with an influenza-like illness. Washington State is among several states reporting deaths due to community-acquired MRSA pneumonia associated with influenza infection this winter.



Clumps of methicillin-resistant *Staphylococcus aureus* bacteria (MRSA). Magnified 2381x
Content: CDC/ Jeff Hageman, M.H.S.
Photo: Janice Haney Carr

S. aureus Secondary Pneumonia

Secondary bacterial pneumonia is a well-recognized complication of influenza. Until recently, *S. aureus* pneumonia has been considered primarily a nosocomial infection. On rare occasions it was a cause of community-acquired pneumonia following influenza in healthy persons. Such cases were reported during the 1968 influenza pandemic, with a high case fatality rate. However, formal surveillance for staph pneumonia has been limited.

In 2006 an article reported 17 cases of severe community-acquired staph pneumonia including 15 (88%) MRSA infections identified during the 2003-2004 influenza season.[1] All cases were associated with influenza-like illness and 12 had laboratory confirmed influenza. The cases were reported from nine states. Median age was 21 years (ranging from 3 months to 62 years). Most patients had hypotension and almost half had documented blood stream infections. Low white count and low platelets occurred in about a quarter of patients. Four patients with MRSA died (27%), only one with an underlying illness. Most of the cases were due to the single most common community-acquired MRSA strain, USA300.

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In January 2007 CDC received reports of ten cases of severe community-acquired MRSA pneumonia resulting in hospitalization or death, an unexpectedly high number. Subsequent investigation of these cases were reported in Louisiana and Georgia.[2] Of the ten cases reported, eight were healthy persons under 30 years of age (median age 17.5 years, range 4 months to 48 years). All had preceding influenza-like clinical illness and six were laboratory confirmed. Five MRSA strains were investigated and all were designated USA300 with indistinguishable PFGE patterns. Disease progression was rapid in these ten cases. Four of the six deaths were within four days of onset of respiratory symptoms. Four case patients or their close contacts had prior MRSA infection documented.

Preventing influenza would greatly reduce the risk of MRSA pneumonia in previously healthy young adults. Of note, a majority of the cases in both reports were not in recommended groups for influenza vaccination based on age and previous health status.

During the 2007-2008 influenza season, Oregon and Washington departments of health received reports of necrotizing staph pneumonia associated with flu-like illness and confirmed influenza. These included severe cases of pneumonia caused by MRSA.

Investigating Staph Pneumonia

CDC's Influenza Branch is interested in severe cases of any staph pneumonia associated with influenza-like illness or confirmed influenza. Health care workers should test for influenza in staph pneumonia cases with a preceding influenza-like illness (see below for specimen requirements). Local health jurisdictions should be notified to assist with the investigation. Local health jurisdictions can contact Communicable Disease Epidemiology Section for assistance.

PCR testing for influenza is available at Department of Health Public Health Laboratories (PHL). Instruct health care providers to collect nasopharyngeal / nasal specimens (swab, aspirate, wash) using a swab with a Dacron™ tip and an aluminum or plastic shaft. Do not use a swab with a calcium alginate or cotton tip, or a wooden handle. Appropriate personal protective equipment should be used when collecting any respiratory specimen to avoid being exposed. If possible, collect specimens within the first 4 days of illness. Hold specimens at 4°C and transport to the laboratory promptly.

Any staph isolates from severe pneumonia cases should also be sent to PHL regardless of influenza test results. PFGE can be done for clusters or unusual situations. All such investigations should be done with the assistance of the local health jurisdiction.

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Prevention

As MRSA infections increase in the community, there is likely to be a continued increase in cases of severe MRSA pneumonia. Steps for the public to take include:

- obtain annual influenza vaccination, particularly if in a recommended group
- practice good hygiene
- maintain wound care with skin infections that could be staph
- consult a healthcare provider for respiratory or skin infections
- if you have flu or pneumonia notify your healthcare provider of recent MRSA infections among you and your close contacts

During the February 2008 meeting, the Advisory Committee on Immunization Practices (ACIP) decided to expand the recommendation for annual influenza vaccination to all children age 6 months through age 18 years. The previous recommendation was only for children age 6 months through 59 months of age. The recommendation will take effect for the 2008-2009 influenza season. Other recommended groups are adults fifty years and older, women who will be pregnant during the flu season, persons with chronic medical conditions, residents of long-term care facilities, and health care personnel.

Healthcare providers should consider MRSA as a possible cause of pneumonia when treating severe community-acquired pneumonia, particularly if outpatient antibiotic therapy has failed or disease is progressing rapidly. In addition to other indicated cultures such as blood or pleural effusion the healthcare provider should obtain a sputum culture for such cases.

Previously known as a hospital-acquired infection, MRSA has emerged and become established as a community-acquired cause of skin and soft tissue infections in healthy persons. Parallel with the increase in MRSA there has been an increase in MRSA community-acquired pneumonia cases in this country during influenza season. The trend is likely to continue into the future as MRSA becomes more common in communities. Reducing infections and providing timely appropriate treatment are essential for patient care.

References

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2. Severe Methicillin-Resistant *Staphylococcus aureus* Community-Acquired Pneumonia Associated with Influenza --- Louisiana and Georgia, December 2006—January 2007 (April 13, 2007 MMWR (Vol. 56[14];325-329)
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